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WEST RALEIGH

FEEDING AND MANAGEMENT OF BEEF CATTLE

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SUMMARY

The feeding of beef cattle should occupy an important place in our system of agriculture because of the additional value thus obtained from cottonseed meal, the chief concentrated feed used in this State.

The soils of the State are generally in need of large quantities of humus, which can be supplied to a large extent from manure. The cheap roughages and concentrated feeds used for fattening beef cattle will when turned into manure supply the soil with this material.

More attention should be paid to the selection of feeding cattle. There is a tendency at present to buy a cheap grade of mixed cattle, which will use approximately the same amount of feed as good cattle, but which will neither gain as rapidly, nor increase the value of the finished carcass to the same extent.

After shipping cattle from the mountains, it is a good plan to feed them on roughages largely for two or three days. A small amount of corn silage will be beneficial in overcoming any trouble incident to the direct change from pasture to dry feeds. A small amount of cottonseed meal may be used with the silage and dry roughage during this period. Not more than one pound of the meal should be fed daily, however, during the first few days of the feeding period.

Beef cattle should not be cramped in muddy, filthy, unventilated quarters. They can withstand considerable cold without harmful effects, although they should not be subjected to undue exposure. An open shed protected on the north, east and west is sufficient for feeding beef cattle. In saving the manure, however, it is best to confine them in roomy sheds or barns partially open to the south.

If the sheds are large, roomy and well ventilated and water is supplied inside of the building it is not necessary to allow cattle the run of an open lot. In fact, such a practice is not advisable under Southern conditions.

Water and salt should be kept continually before the steers. By so doing they will never take more than is necessary, while if they are supplied at irregular intervals considerable trouble may arise. The idea that water and salt should be given in limited quantities is a mistake, as this practice will be detrimental to the best interests of the cattle feeder.

For a short feeding period ranging from one hundred to one hundred and twenty days not more than four to five weeks should be required to get steers on full feed. The amount of roughage fed should be determined by the appetite of the animals. No more should be given than will be cleaned up readily at each feed.

The cottonseed meal part of the ration should not be increased on the average more than two pounds per animal per week. By feeding one pound of meal per steer for the first few days and then increasing it at the above rate, the steers will be on a full ration of seven to eight pounds about the end of the fifth week.

In many cases cattle are fed too much cottonseed meal, especially during the preliminary period. The writer knows of certain instances in this State where cattle were started on a ration containing four pounds of cottonseed meal per head daily. This practice can not bring other than unsatisfactory results.

If the cottonseed meal is fed at the rate of three-quarters of a pound per hundred pounds live weight, no trouble should arise from its use. A thousand pound steer on full feed would get at this rate seven and one-half pounds per day, which is a safe and efficient ration for a one hundred to one hundred and twenty day feeding period.

If a thousand pound steer is fed from 900 to 1,000 pounds of cottonseed meal properly distributed over a feeding period of one hundred to one hundred and twenty days the results should be satisfactory.

After cattle once go on fattening feeds, they should be put in marketable condition as rapidly as possible. Such a practice will insure larger financial returns. Care should be taken, however, not to unduly increase the rations in the beginning as trouble is likely to arise if too much cottonseed meal is given.

A good grade of feeding cattle should gain at least two pounds per animal daily, if properly fed. By using a better grade of cattle, the gains will not only be increased, but the quality of the finished carcass will be better, and it will sell for a higher price per pound.

Considering the condition of the beef cattle industry of the State at present, the most satisfactory financial results will be obtained usually by selling the finished cattle at home. The average grade of cattle fed in the State at present will not net as large returns on the central markets as on the home markets. The farmer can afford to take from forty to fifty cents less per hundred pounds live weight, and sell his cattle at home, thus avoiding the heavy shrinkage incident to shipping and the uncertainties of the central markets.

FEEDING AND MANAGEMENT OF BEEF CATTLE

By R. S. CURTIS.

Reasons for Feeding.

The reasons for feeding beef cattle in the South are evident to those who have given soil management serious consideration. While it is not absolutely necessary to feed cattle on the farm to maintain the fertility of the soil, it is recognized as an important factor toward this end. The by-products of cottonseed are at our door and the South at present is using for cattle feeding purposes only a small portion of the cottonseed meal which it manufactures. The exports of cottonseed and cottonseed meal are approximately 1,000,000 tons yearly, while large amounts of the meal used in the State are used directly for fertilizing purposes. This seems like a grave mistake when a good grade of feeding cattle can be obtained in the mountains of the State to turn this cottonseed meal into beef and manure. If the feeders of other States can afford to ship these cattle for feeding purposes, there seems to be no good reason why they should not be fed in this State on cottonseed meal which has nearly double the feeding value of corn. Many of these feeding cattle are handled by two or three parties, each realizing their profit, after which Virginia, Tennessee or South Carolina feeders fatten them and realize even then satisfactory returns on the transaction. If our farmer feeders buy these cattle direct from the growers, thus saving the middleman's profit, it will be a good investment to aid in restoring some of the impoverished farms.

It may be conservatively stated that all farmers who will feed a few beef cattle each winter, will soon double and even triple the value of their cultivated lands. Manure will bring about permanent improvement in the soil which commercial fertilizers as ordinarily used can not accomplish alone. The fertilizing value of cottonseed meal used for feeding purposes and returned in the manure will be at least seventy-five per cent of its original value. Therefore by feeding it to beef cattle its entire feeding value, and three-fourths of its fertilizing value can be obtained against its fertilizing value alone when used directly in the field.

A proposition of this kind which has been shown to be practical by actual demonstration should cause many farmers to give the matter serious consideration. Education along this line is imperative. It means richer farm lands and larger and more profitable crops for those who use conservative judgment in putting the practice into operation.

The Beef Cattle Industry in North Carolina.

The beef cattle industry at present is in an unsatisfactory condition for two reasons. First, many of the farmers who feed cattle live in the city, having regular employment therein, and are conducting their farms as an adjunct to their city business. This necessitates the employment of laborers usually very unskilled in the feeding and manage-

ment of live stock. Even with feeds having no detrimental properties such as cottonseed meal has, the industry would suffer to a material extent under such management. Because of our dependence on cottonseed meal to furnish the concentrated portion of the ration, the condi-



Fig. 1.—A water supply system of 5,000 gallons capacity suitable for cattle feeding and general farm purposes.

tion is especially unfortunate for the feeder. The writer has visited a number of farms where cattle were being fed, and unfortunately in many instances unbusiness-like methods of feeding were in use. Cottonseed meal, to return the most satisfactory results, must be fed with care and judgment. As a result of slack methods, farmers are reporting small gains and in exceptional cases a depreciation in the value of the

original animals. Such results can be overcome by using a specific plan in administering the rations. Unless some definite method of feeding is followed in all important details, unsatisfactory results are sure to follow. The writer will attempt to outline some of the most important factors to be taken into consideration in order to secure good average results. If the large feeders of the corn belt used such a system of management as prevails in general throughout this State they would not be able to follow the cattle feeding business many years. In a number of instances the writer has seen cattle in this State with a constant supply of cottonseed meal and cottonseed hulls before them, the feed troughs never being entirely cleaned of their contents.

This accumulation of feed in the trough is sure to bring on troubles incident to the use of large quantities of cottonseed meal. This system of feeding even with the ordinary feeds would soon bring about disastrous results. By using care and judgment in feeding, this State can be made second to none in the production of beef cattle.

Season for Feeding.

For several reasons the winter season is naturally the best time to feed beef cattle in this section of the country.

First, it is difficult to buy feeding cattle in the spring. In the mountain country, where practically all the feeding cattle are produced, the grazers will not sell in the spring of the year except for exorbitant prices, because of their desire to take advantage of the cheap gains which can be made during the spring, summer and early fall. The feeder can not pay the necessary price to secure feeders in the spring and come out even on the transaction. After these cattle have made their maximum gains on pasture, which will be from the first to the fifteenth of October, the grazers are ready to sell. Naturally these cattle can be bought at this season at a lower price than at any other time of the year.

Second, cottonseed meal can be purchased cheaper during the fall months, when the season's crop is first placed on the market.

Third, the farmer has more time during the winter season to supervise the feeding of cattle and distribute the manure over the farm.

Fourth, a higher price can be obtained for finished cattle during the winter and early spring months because the competition of grain fed cattle during the spring and summer with grass fattened cattle would force the price of the grain fed cattle to an unprofitable figure. Furthermore, the climatic conditions in this State makes the winter season very desirable for feeding beef cattle. The cold is not severe enough to influence the gains, in fact, considering all the factors involved, the winter season is more favorable for cattle feeding than the summer season.

Method of Feeding.

The usual method followed in feeding beef cattle is to divide the daily ration into two equal feeds which are given in the morning about seven and in the evening about four. This is a matter which should receive

close attention as no one thing pays better in the feed lot than regularity in feeding and caring for the steers.

The length of the feeding period under Southern conditions should range from one hundred to one hundred and twenty days, the period being necessarily limited in length because of the effect of cottonseed meal after a certain rather definite time. The writer believes that the shorter feeding period with the maximum safe ration of meal is better than the prolonged period with the smaller ration, a plan followed by some feeders.

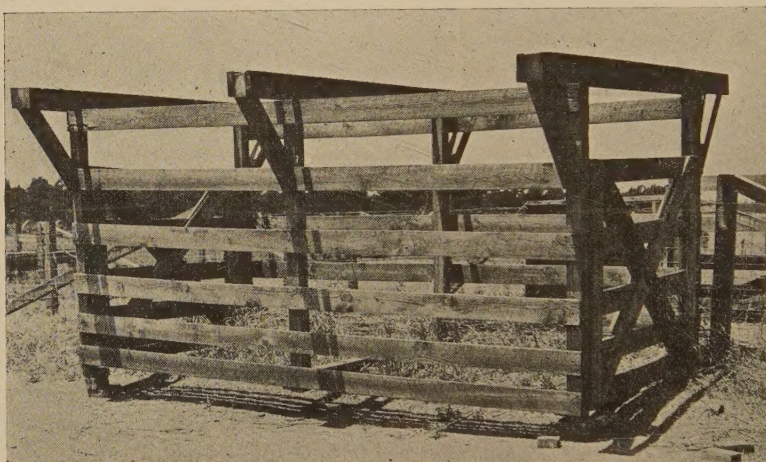


FIG. 2.—A movable scale rack for weighing beef cattle. When supplied with rollers and a track, it can be removed from the scales for weighing roughage.

The latter practice rarely pays except for young stock which it is intended to force later. Beef cattle intended for the market when finished, should be forced to maturity as rapidly as conditions will permit. In all cases mature judgment should be used in keeping the steers from going off feed. It is far better to hold them in check somewhat than to allow this condition to arise.

If the concentrated part of the ration consists of cottonseed meal entirely steers will rarely make satisfactory gains or increase much in value after one hundred and twenty days. It may be possible to feed somewhat beyond this period but unless there is a corresponding gain and increase in the value of the cattle such a practice will rarely pay for the extra feed given.

Feeding Equipment.

The most economical method of feeding beef cattle in this State is to confine them either in small lots where shelter is easily accessible, or under large roomy well ventilated barns or sheds. By following this latter plan the manure will all be conserved, which is an important factor. The former method, while less expensive, has the disadvantage of

leaving part of the manure exposed to the weather. However, if the feed lot is small and kept well bedded, the loss of manure may not be great. The writer prefers a large covered barn, well ventilated, with water and salt provided inside. A barn of this type need not be expensive. The principal cost will be in the roof, the sheltered sides being boarded up only part way. For those who care to allow their cattle in the open a short time each day or at frequent intervals, a small lot to the south may be provided. However, if the barn is large, amply ventilated and the cattle are not cramped, there is no necessity for allowing them outside. Beef cattle should be kept quiet, to make the most rapid gains.

The practice of allowing the cattle access to a large open lot is not conducive to rapid and economical gains. Stall feeding sometimes practiced in the State, is also expensive because of the extra cost of buildings and labor involved. The former method described is advocated by the largest and most successful feeders. The cattle are easily fed and they have practically the same advantages as the stall-fed animal. From the financial standpoint, stall feeding is not practical under Southern conditions, and it is doubtful whether it is a judicious practice in other sections.

Grades of Feeders.

In Figs. 3, 4 and 5 is shown the difference in the grades of feeding cattle found on the various markets in this State.

The common grade of feeders are light and rough and are lacking in flesh, capacity and early maturing qualities. Their weight ranges from 800 to 950 pounds. Such steers make small gains and do not improve in value materially even with careful feeding. The same statement ap-

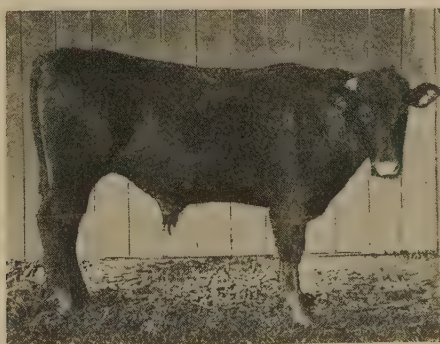


FIG. 3.—A very faulty feeder, lacking in weight, capacity and breeding.

plies to the mixed lots consisting of inferior steers, cows, heifers and oxen which are frequently used. These feeders are generally of mixed blood, not uniform in size or weight, making small gains with an uneven finish. Neither of the two classes are satisfactory for the discriminating market.

Feeders which class as medium consist of steers weighing from 900 to 1,000 pounds. They are fairly uniform in size, although the type varies to a limited extent. The breeding is more uniform than that of the common grades. They possess more natural flesh or muscle than common feeders and they are smoother and more uniform in maturing. This class of cattle for the average feeder, especially the beginner, will give very satisfactory results as they can generally be purchased at a reasonable price and sold at a figure sufficient to clear the feeder without the necessity of straining market quotations.

The good to choice grade of feeding cattle consists of steers weighing from 950 to 1,100 pounds. They are of uniform breeding, average well in size, type and color, possess considerable quality, are smooth and well muscled and finish evenly. This grade of cattle goes mostly to Virginia feeders who bid the highest prices for them. These cattle are generally finished on corn and sold at the central shipping points for prices considerably higher than the quotations on local markets.

The above classification has not been given with the idea that it is exhaustive or complete but for the cattle feeders of this State it will serve as a rough guide in selecting cattle for fattening purposes.

Selection and Cost of Feeders.

The selection and purchase of feeding cattle should receive very careful attention. This is one of the most important factors in making a success of the feeding business. No matter how well a steer may be

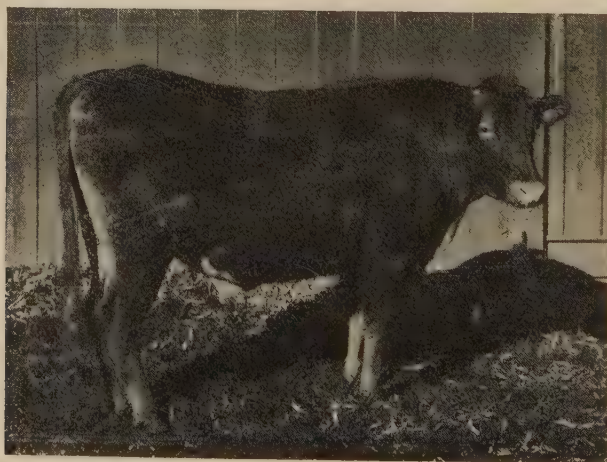


FIG. 4.—A steer with sufficient weight, but one with a low dressing percentage. The back is low, the ribs are too flat, the rear quarters are light, and the paunch contains too much offal.

fed and cared for, if the margin between the buying and selling price is not properly adjusted, loss is certain. Too much emphasis can not be placed on this point. The grade of feeders purchased will necessarily determine the price within certain limits. The class of cattle to be fed

should first be decided upon and then the price adjusted according to market conditions. In this State the major portion of the feeders shipped to the Eastern and Piedmont sections are common cattle. They may be divided into two general classes, namely, plain rough steers and mixed feeders consisting of cows, heifers, stags and oxen. While there may be a market for a limited number of these, they are unsatisfactory in the feed lot as they make small gains, and do not sell satisfactorily because of their lack of breeding, condition and uniformity.

Good feeders consist of steers, low-set, broad and deep, with good length of body smoothly and heavily covered with natural flesh or muscle. An animal of this type will gain well in the feed lot under normal conditions. It is possible to make gains on such steers ranging from two to three pounds per day. The ordinary class of feeders used throughout the State, under average conditions, will gain from one to one and one-half pounds daily. If sufficient care and time is taken in purchasing feeding cattle, much improvement can be effected in this respect. At present a good average grade of feeders can be purchased for four cents per pound or thereabouts, mountain weights, and the increased gains which can be made on this class of cattle with the better selling price will more than overbalance the difference in cost of these cattle and plain rough feeders.

Feeding cattle should be neither too old nor too young. Very young steers will not fatten readily, and especially is this true considering the nitrogenous character of cottonseed meal. There is not so much danger, however, in getting stock too young as there is in buying those which are old, unthrifty and very late in maturing qualities. The best results will be gotten from two and three year old steers under Southern conditions. They will fatten readily, and will not be so likely to become affected by heavy cottonseed meal rations as younger steers.

Frequency and Regularity of Feeding.

Steers intended for the open market are ordinarily fed twice daily. During the winter season when most of the cattle are fed, the feeding should be done at some regular time each day. Seven in the morning is not too early, as the steers will generally be ready for their feed at this time. In the afternoon, if they are fed about four-thirty, they will have time to consume their feed before night. It is not so important that they be fed exactly at these hours, however, it is important that regularity in the hours of feeding be followed throughout the feeding period. If the hours given above interfere with farm work, they may be changed to fit in with this work, although it would not be best to depart radically from the hours stated. The time between feeds should be divided as equally as possible, and these hours followed with considerable regularity.

Water and Salt.

Water and salt should be supplied regularly. The best plan to follow is to keep the water and salt where the steers can have free access to them. In this way they will satisfy their appetite daily and not take an undue quantity at any time. There is a mistaken idea prevalent in

some sections of the State, that water and ~~drift~~ ^{feed} should be supplied at certain intervals during the day or week. A practice of this kind is sure to result in trouble in a large number of cases. If the steers are given free access to these necessities they will rarely if ever take more than needed.

Available Feeds.

The feeds which are available in the State, from an economical standpoint, are cottonseed meal, corn stover, corn silage, and cottonseed hulls. In certain instances, varying with local conditions, other roughages may be used but their importance in cattle feeding is limited. For example, cowpea hay is a standard feed, but the price is prohibitive for fattening beef cattle. In feeding dairy cattle this feed may be used because of the larger and more profitable returns.

Cottonseed meal without doubt will form the main concentrated feed for fattening cattle. It is the only concentrate produced in sufficient quantities at a price which will justify the cattle feeder in using it.

Corn stover and corn silage may be produced on the farm in quantities sufficient to fatten many more cattle than are now annually fed. They are both well adapted to feed with cottonseed meal because of their carbonaceous nature. Better use should be made of these feeds, considering the price at which they can be produced as compared with the market price of cottonseed hulls. While the latter gives very satisfactory results, the fact should not be lost sight of that the farmers of this State allow large quantities of corn stover to waste which can be used to equal or better advantage than the hulls for feeding beef cattle.

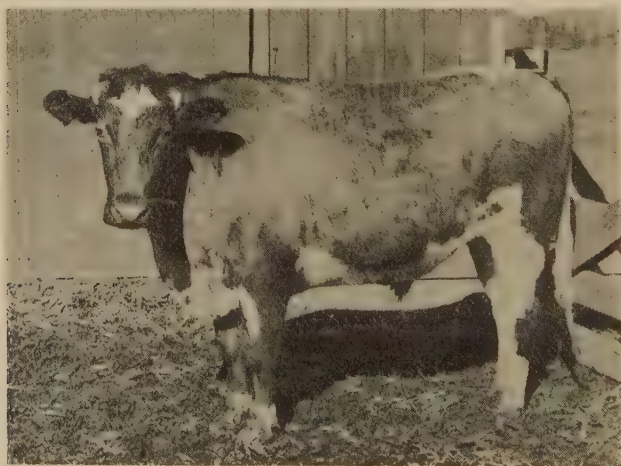


FIG. 5.—This steer will grade as a fair feeder, although more weight in the rear quarters would be desirable. A steer of this type will fatten readily and finish smoothly.

Likewise corn silage which has produced such satisfactory results in the experimental work at this Station should be more widely used. In the Northern and Western States this feed is rapidly finding a place in the

beef cattle ration. Its desirable effect has always been very evident wherever it has been fed. If more of the corn crop was preserved in this way it would mean larger profits in the cattle feeding industry.

With cottonseed meal valued at \$28.00 to \$30.00 per ton, corn stover at \$7.00 to \$8.00 and corn silage at \$2.50 to \$3.00, there is little excuse for using such large quantities of cottonseed hulls which will cost from \$7.00 to \$11.00 per ton, the market price depending on the season of the year.

Corn Silage for Beef Production.

The indications from the experimental data at hand are that corn silage will become an important factor in beef production in the State. In Station Bulletin 218 are given some results obtained with this feed. The average profit per steer obtained from two years work was in favor of the cattle fed on cottonseed meal, and corn silage alone for roughage. Whether the same results will always be obtained is to be determined. It is thought, however, that larger quantities of cottonseed meal can be fed successfully by using corn silage in the ration. This is a point of special significance to be reported in a subsequent bulletin.

As a general thing, cattle which are fed silage make better use of their feed and finish more satisfactorily. The hide and hair is kept mellow and glossy, which is a good indication of thrift in fattening cattle. In Indiana about seven per cent of the cattle feeders are using corn silage in their beef cattle rations. In a recent bulletin of that Station it is stated that the addition of corn silage to a ration of shelled corn, cottonseed meal and clover hay, resulted in more rapid and cheaper gains, and greater profits per steer than any other ration fed. It is stated that the results indicate that corn silage may be used profitably as a portion of the ration in finishing steers. Workers at other stations have shown the advantages of corn silage in beef production, although the kind of supplementary feeds used with silage will vary the results obtained. Because of this fact, the use of corn silage with cottonseed meal in the South is a problem in itself, which the writer hopes to work out in a definite form.

Preliminary Feeding Period.

One of the greatest sources of trouble among cattle feeders of the State is the irregular methods used in getting cattle on full feed. With the safest of feeds, some men by careless methods and undue crowding of the cattle may get them off feed, which brings on scouring, a very troublesome condition in the feed lot. With cottonseed meal, a rich nitrogenous feed of a laxative nature, and toxic when fed in excessive quantities, extra precaution should be taken in getting steers up to full feed, and keeping them in a normal condition thereafter. A number of cases have been reported where the results from the meal feeding have not been satisfactory. The trouble was no doubt caused largely by irregular feeding on varying quantities of the meal or by forcing the cattle too fast in the beginning. Such a practice in the feed lot can never bring other than unsatisfactory results.

The data given in Table 1 will be of considerable aid to cattle feeders if they will follow the general plan outlined of increasing the cottonseed meal part of the ration as given therein. These rations are figured out on a basis of one steer, ten steers and multiples of ten up to one hundred. By selecting the horizontal column giving the number of steers being fed, the proper bi-weekly increase of meal may be determined by the figures following to the right of the page. For example, if thirty steers are being fed, they should receive 15 pounds of cottonseed meal each feed the first half of the week, 22.5 pounds each feed the last half of the week, 30 pounds each feed the beginning of the second week, and so on through the period until they are on a full ration of 210 pounds the fifth week, which makes the total ration for each steer seven and one-half pounds daily.

It will very likely not be best to increase the meal to the amount indicated in the last half of the sixth week for the final period unless the steers are of an unusual weight. With present knowledge of the subject, it is suggested that seven to seven and one-half pounds should constitute the maximum daily ration of meal during the final period.

TABLE 1.—GIVING THE QUANTITIES OF COTTONSEED MEAL IN POUNDS TO FEED DURING SUCCESSIVE STAGES OF THE PRELIMINARY PERIOD.

Number of Steers	Time of Feeding	NUMBER OF WEEK											
		First Week		Second Week		Third Week		Fourth Week		Fifth Week		Sixth Week	
1 steer	a. m.	.5	.75	1.	1.25	1.5	1.75	2.	2.5	3.	3.5	3.5	4.
	p. m.	.5	.75	1.	1.25	1.5	1.75	2.	2.5	3.	3.5	3.5	4.
10 steers	a. m.	5.0	7.50	10.	12.50	15.0	17.50	20.	25.0	30.	35.0	35.0	40.
	p. m.	5.0	7.50	10.	12.50	15.0	17.50	20.	25.0	30.	35.0	35.0	40.
20 steers	a. m.	10.0	15.00	20.	25.00	30.0	35.00	40.	50.0	60.	70.0	70.0	80.
	p. m.	10.0	15.00	20.	25.00	30.0	35.00	40.	50.0	60.	70.0	70.0	80.
30 steers	a. m.	15.0	22.50	30.	37.50	45.0	52.50	60.	75.0	90.	105.0	105.0	120.
	p. m.	15.0	22.50	30.	37.50	45.0	52.50	60.	75.0	90.	105.0	105.0	120.
40 steers	a. m.	20.0	30.00	40.	50.0	60.0	70.00	80.	100.0	120.	140.0	140.0	160.
	p. m.	20.0	30.00	40.	50.0	60.0	70.00	80.	100.0	120.	140.0	140.0	160.
50 steers	a. m.	25.0	37.50	50.	62.5	75.0	87.50	100.	125.0	150.	175.0	175.0	200.
	p. m.	25.0	37.50	50.	62.5	75.0	87.50	100.	125.0	150.	175.0	175.0	200.
60 steers	a. m.	30.0	45.00	60.	75.0	90.0	105.00	120.	150.0	180.	210.0	210.0	240.
	p. m.	30.0	45.00	60.	75.0	90.0	105.00	120.	150.0	180.	210.0	210.0	240.
70 steers	a. m.	35.0	52.50	70.	87.5	105.0	122.50	140.	175.0	210.	245.0	245.0	280.
	p. m.	35.0	52.50	70.	87.5	105.0	122.50	140.	175.0	210.	245.0	245.0	280.
80 steers	a. m.	40.0	60.00	80.	100.0	120.0	140.00	160.	200.0	240.	280.0	280.0	320.
	p. m.	40.0	60.00	80.	100.0	120.0	140.00	160.	200.0	240.	280.0	280.0	320.
90 steers	a. m.	45.0	67.50	90.	112.5	135.0	157.50	180.	225.0	270.	315.0	315.0	360.
	p. m.	45.0	67.50	90.	112.5	135.0	157.50	180.	225.0	270.	315.0	315.0	360.
100 steers	a. m.	50.0	75.00	100.	125.0	150.0	175.00	200.	250.0	300.	350.0	350.0	400.
	p. m.	50.0	75.00	100.	125.0	150.0	175.00	200.	250.0	300.	350.0	350.0	400.

Final Feeding Period.

The final feeding period is the time during which steers should make rapid progress toward fitting for market. When they are first placed on feed it is necessary to proceed slowly until the animals adapt themselves to the change. During this time the gains will be small as the chief object during the preliminary period should be to regain the shrinkage lost in shipping and to adapt the digestive system to the new feeds.



FIG. 6.—A type of animal too often seen in the feed lots of this State. Cattle of such breeding are too inferior to use high priced cottonseed meal.

After steers are once placed on a full ration, the fewer the changes in kind of feed, and other of their surroundings, the more satisfactory the results will be, other things being equal. The only change which should be made will be the amount of feed, which should be regulated by the appetite and condition of the animals. Changes should be made very gradually, as there is nothing more fatal in steer feeding than irregular care and management. This is especially true when using a feed like cottonseed meal. A succulent feed like corn silage should be introduced into the ration gradually and eliminated in the same way if for any reason this becomes necessary. Sudden changes to and from watery feeds, such as silage, often cause digestive disturbances such as scours, which are very disastrous in the feed lot. It is important to use dry feeds with caution, yet there is not the same danger as with silage, which contains about eighty per cent of water, a factor often responsible for the washy condition in steers fed corn silage alone. When steers are first taken from the pasture it is a good plan to feed a small amount of corn silage with the dry roughage feeds. If this can be done it will help materially in overcoming the effect of sudden changes from pasture to dry feeds, now largely used for fattening steers.

The final feeding period should be characterized by regularity both on the part of the feeder and the animals. The appetite of the steers should be kept keen by regular and judicious feeding and the gains therefore made larger and more uniform. Any sudden departure from

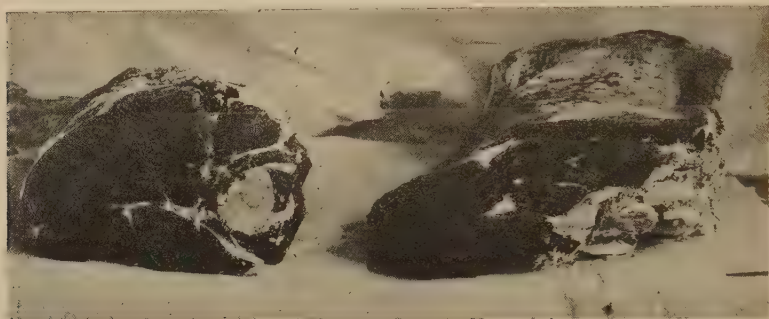


FIG. 7.—The class of meat which comes from animals like that shown in Fig. 6. The cuts of meat are small, they lack marbling and are consequently tough and unpalatable.

this record should be taken as an indication of trouble either in the feeding or management. The sooner this condition is checked the better, as the unsatisfactory results often obtained are caused by lack of attention to these details.

Gains Per Day.

As a general thing the class of cattle used in this State for feeding purposes do not make profitable gains. Larger daily gains should be secured, which will reduce the cost of production. A large number of the cattle will not average over one and one-fourth pounds gain per day. A good grade of cattle should make at least two pounds gain daily, and even two and one-half pounds would not be unreasonable to expect of them. The better classes of cattle sold on the larger markets will make as high as three or three and one-half pounds gain daily when on full feed. In selecting cattle for feeding purposes, growthy steers with ample capacity for using feed should be secured. The angular type of animal so often seen in the feed lot is an inferior gainer, and a slow seller. The broad backed, low-set, deep bodied steer will, as a general thing, make much larger gains on an equal amount of feed, than the small angular type of animal.

Season of Marketing.

The season of marketing beef cattle in this State has a narrow range for the reason that practically all of the cattle fed come from the mountains of this State where the pastures generally begin to deteriorate about the first of October, so that the grazers contract to deliver the feeders from October 1st to 15th. For this reason most of the good cattle are put on feed by October 15th to November 1st.

It will be seen therefore that unless cattle are fed on roughage feeds temporarily in the fall a large portion of them will be placed on the market about the same time the following spring. A great many of the

cattle are ready for market about March 1st of the following year. Such a condition necessarily causes an oversupply of fat cattle, especially on the local markets, where most of them fattened in this State are sold. If the beginning of the feeding period could be deferred for one month even, so that some of these cattle could be marketed between the time the major portion of the grain fed cattle are sold, and the grass cattle come on the market, they could be disposed of more readily and at better prices. As this is important, any system which can be devised to remedy it will be a great benefit to the cattle feeders of the State.

Selecting and Sorting for Market.

In buying cattle for feeding purposes, it is important that they be purchased at a reasonable price. Cattle well bought are half sold. Likewise, it is important to obtain the highest market price possible, and to do this the cattle should not only be fat but they should be uniform in size, type and quality.



FIG. 8.—A lot of 800-pound feeders, too young to fatten satisfactorily in a short feeding period, although otherwise they average very well in feeding qualities.

Some cattle feeders have the idea that the good cattle in the lot will sell the inferior ones. This is a mistake, and especially so when they are sold on a central market. On the other hand it is true that the inferior cattle will depress the selling price of the whole lot. Local butchers are not so critical, yet it is far better to have a uniform lot of cattle even for this market. In the large stock markets, the speculator makes a profitable business of buying mixed lots of stock, sorting them according to weight, quality and condition, and then reselling them at an advanced price because of their uniformity.

It is important that cattle feeders pay more attention to this point. An unsatisfactory sale is often the result of not giving these matters proper thought and care. When cattle are shipped or if a buyer comes to the farm they should be properly divided in the way mentioned above. If one-half of a lot of steers are in high condition, and one-half in low condition, it would be unwise to mix them with the idea that the steers in low condition would sell as well as the others. In a case of this kind, it would be much better to offer the good ones for sale in a lot by themselves and retain the others until they were fat.

Marketable Condition.

The quality of the meat obtained from a steer depends to a large extent upon the amount of fat the animal carries. However, it should not be understood that a steer must have an overabundance of fat in order to make prime beef, but they should be in sufficiently high condition to give succulence and flavor to the meat. A prime grade of meat should have among other important characteristics, a medium pad of outside fat, and should be well marbled with fat between the muscular tissues. Very few of the steers fattened in the State ever reach this condition. In fact, the majority of them are sold just when the veteran corn-belt cattle feeder would put them in the feed lot to fatten. This is a condition which must be overcome before the highest price can be obtained for fat cattle. Before the markets will discriminate between the different grades, classes and condition of cattle, they must have the different grades and classes provided for discrimination. A well fattened animal will dress out a larger percentage and a better quality of edible meat than one in medium condition, and for this reason the markets will pay more for the high grade well fattened animals. The situation may be such that it will not pay to put cattle in exceptionally high condition. However, in the South, where the feeding period is of short duration, it is necessary to push them to the limit of the feeding period in order to get them in the best possible market condition. For this reason it is not likely that cattle fed on cottonseed meal will become too fat.

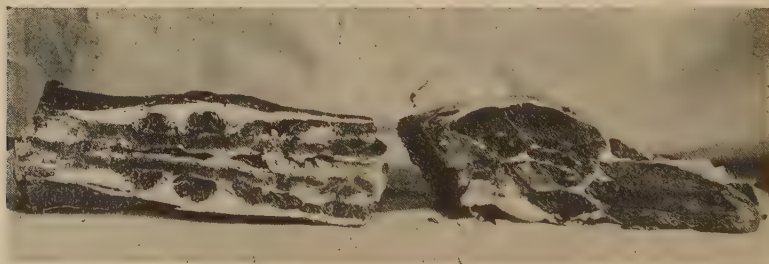


Fig. 9.—A brisket from a high grade steer on the left, and a loin from a low grade cow on the right.

The principal indications of a well fattened animal are a fullness at the tongue root, at the base of the tail, a low well filled flank, a full twist and cod, all of which are correlated with the smooth, even and firm covering of body fat, which gives the rotundity of form characteristic of the fat animal.

Preparation for Shipment.

The preparation of cattle for shipment is very important. No matter how well steers may look at home if they are not properly prepared for shipment their shrinkage will be heavy and their condition will not be conducive to a ready and satisfactory sale at the stock yards.

From twelve to twenty-four hours before the cattle are loaded in the car, the grain ration should be cut down very materially, and dry roughage given instead. This is especially true if corn silage is fed, which

is likely to cause a washy condition when the steers get heated and excited. As cottonseed meal is a laxative feed, great care should be used in feeding it for a day or two before shipment. It is a well known fact that grass fattened cattle shrink abnormally when shipped. In shipping cattle every precaution should be taken to withhold green feeds, such as grass, silage, or any of the concentrates, such as cottonseed meal and linseed meal, which are likely to purge the animals. It is a good plan to feed hay principally, the day before shipment. Timothy hay is recognized as being ideal for this purpose. If this can not be obtained, corn stover or cottonseed hulls will serve the purpose. Clover, alfalfa or cowpea hay should not be fed at this time because of their laxative character. Water and salt should be withheld for six to eight hours before shipment. The use of salt to secure a good fill of water is neither a paying proposition nor a legitimate practice.

The car should be well bedded with straw, sawdust or some other litter convenient for use, and the cattle should be loaded snugly, but not packed. Prior to shipment all undue excitement should be avoided. If these suggestions are followed the cattle should reach market in good condition, ready to eat and drink normally before sold. Careful and intelligent management will assure both the shipper and the buyer honest weights and satisfactory returns.

Cost of Shipping.

Usually the cattle feeder can afford to take from forty to fifty cents per hundred pounds less for his cattle on the local market. This is especially true for the beginner who may not be able to judge when cattle are ready for the market or when it is most advisable to ship for other reasons. The following figures will enable the feeder to determine with considerable accuracy what the shipping expenses will be to Baltimore on one carload of fat cattle, assuming the selling price to be six cents per hundred. The cost of shipping to Richmond would be somewhat less than the figures given below.

Shrinkage on 30 cattle, 40 pounds per head—1,200 lbs.	
@ 6 cents per pound	\$ 72.00
Freight	66.00
Commission charges	30.00
Yardage, feeding and weighing	12.00
Total	\$180.00

These figures are subject to modification according to the location of the feeder; however, the principal difference would be on the shrinkage and freight charges. It will take considerable experience to judge just when it will pay to ship and when to sell at home. If the price offered at the farm is within reason, however, it will usually not pay to take a material risk. Any one who contemplates shipping should be governed largely by the price offered for the cattle at home and the quotations on the central market. It should be remembered that steers from the

quarantine area are usually quoted at twenty-five to thirty-five cents less per hundred pounds than steers from the non-quarantine areas, although the discrimination in price is not as great as heretofore.

Market Classification.

The subject of market classification is a special study in itself, especially on the larger central markets. It is necessary, however, for the cattle feeder to have a general knowledge of the grades and classes of cattle on the market where his cattle are usually sold. For example, it must be known where cattle will grade in order to study market quotations intelligently and determine the approximate price for which a given lot of cattle will sell. The farmer who has a load of butcher cattle for sale would be at a loss to know what his cattle would likely sell for, unless he actually knew that they would grade as butcher stock. These facts must be known by the man who expects to sell on the central markets intelligently.



FIG. 10.—A lot of 950-pound steers which will grade as medium feeders. This class of cattle is very satisfactory for the average feeder, especially the beginner.

The following classification is used by a Baltimore commission firm and will give some idea of the range in grades and classes of cattle on that market. The figures given are March quotations. It will be noticed that no quotations are given on export cattle during this season of the year, as the supply is limited.

MARKET CLASSES AND QUOTATIONS.

Choice Export Steers	to
Medium Export Steers	to
Choice Butcher Steers	\$6.50 to \$7.00
Medium Butcher Steers	5.50 to 6.50
Good Fat Heifers	5.00 to 6.25
Light Heifers	3.00 to 5.00
Fat Cows	2.00 to 5.50
Bulls	4.00 to 6.00
Oxen	3.00 to 6.50
Fresh Cows	15.00 to 60.00
Good Fat Calves	9.00 to 9.50
Light Common Calves	6.00 to 8.00

Most of the steers sold from this State will grade as butcher stock and a large portion of them will go in as medium butcher steers. Virginia, West Virginia, Kentucky, Pennsylvania, Ohio and Maryland furnish some cattle for the export market, but they are corn fed, having plenty of weight, quality and condition. The product from North Carolina is most likely to be a butcher cattle trade in the steer classes.

Margin of Profit.

The margin of profit on cattle, considering their original cost, the cost of the feed, and the market for fat cattle should be from \$1.50 to \$1.75 per hundred pounds. Even with this margin it is not possible to obtain an appreciable profit from cattle feeding. It is possible, however, to clear the manure, pay for the labor and get possibly from one to two dollars profit per steer. If this profit can be obtained, the cattle feeder should consider himself very fortunate, as many of them lose, although in a great many cases considerable loss could be avoided by a better system of management. If the manure can be cleared, it is well worth the time spent in caring for the cattle because of the value of this product in improving the farms. A large part of the fertility in cottonseed meal is left in the manure, which amply justifies the farmer in feeding beef cattle. If the steers can be fattened and the fertility of the meal retained on the farm without an actual outlay of money it is an economical practice in building up the farms of this State.



FIG. 11.—The class of meat which comes from steers of the grade shown in Fig. 10. Contrast with the cuts of meat shown in Fig. 7.

The principal obstacle to overcome is to get the industry on a firmer financial basis. By reducing the cost of production which is now rather high, the necessary margin to break even can be reduced, thus making possible a larger percentage of profit in the business. When this can be done more cattle will be fed.

Scours.

The man who can not keep scours out of his feed lot is not in a position to make a success of the cattle feeding business. This trouble is the bane of the cattle feeder wherever it becomes prevalent. It is an indication that the digestive system is out of condition, which is caused largely by careless feeding and management. The droppings from a steer which is doing well should be dark in color and firm in consistency.

Any washy or loose condition should be remedied at once, as a steer affected in this way will not only stop gaining, but actually lose flesh if the trouble continues for any length of time.

Under the system of feeding followed in this State, scours are more likely to give trouble because of the laxative nature of cottonseed meal. If corn silage is fed either alone or with some dry roughage it may have a tendency to bring about a lax condition, although this is not likely to happen under careful management. One of the principal precautions to take is to start the steers on a light ration of meal and increase it gradually. If this is done and average judgment is used thereafter in feeding no trouble should occur.

Thrush or Foul-of-the-Foot.

Thrush or foul of the foot is caused by allowing steers to stand in the sheds or yards in manure which has been accumulating for considerable time. For this reason the manure should not be allowed to remain in the barns and yards for an undue length of time. Plenty of bedding should be provided to overcome this trouble as well as to aid in conserving the manure. There is very little that can be done for fattening steers affected with this trouble except to remove the cause. Care should be taken to provide clean and dry bedding. If the steers are not allowed to wade in filthy lots this trouble is not likely to develop.

Effects of Overfeeding with Cottonseed Meal.

It is probably generally known that when cottonseed meal is fed in large quantities, during prolonged periods, it causes either blindness, staggering or possibly death in extreme cases. The writer is not aware of any deaths in this State, although it is stated that a few have occurred. As a general thing with beef cattle, the first indication of the trouble is seen in the failure to make uniform gains. This is followed by a dry rough coat of hair, dullness, sleepiness, possibly a staggering gait and loss of appetite in prolonged cases. Because of this trouble arising after feeding cottonseed meal heavily for one hundred to one hundred and twenty days the chances for making prime fat cattle are greatly reduced unless they are finished on some other concentrate. After steers from two to three years old have been fed from 900 to 1,000 pounds of cottonseed meal, a keen watch should be kept of their general condition and the progress they are making. When the gains begin to grow small it is a good indication that the cattle have taken as much cottonseed meal as the system will stand. When this condition arises they should be marketed as soon as possible, providing this has not already been done before the effects of the cottonseed meal were noticed.

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AGRICULTURAL EXPERIMENT STATION

UNDER THE CONTROL OF THE
TRUSTEES OF THE A. & M. COLLEGE

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Visitors are at all times cordially invited to inspect the work of the Station, the office of which is in the new Agricultural Building of the College.

Address all communications to

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CARE AND MANAGEMENT OF THE DAIRY HERD.

By J. C. McNUTT.

The increasing demand for high class dairy products in North Carolina is a clear indication that more farmers in the State might profitably devote time and money to developing good dairy herds. Up to the present time the number of dairy cows has been so small and the average production so low that it has been necessary to bring large quantities of dairy products into the State every year. There is absolutely no reason why sufficient milk and butter could not be produced within the State to supply the demand, and if the people could be brought to realize the profits in the industry a material improvement would certainly be brought about.

The fact that the climate of North Carolina is so mild that cattle do not have to be stabled only a short period during the year is a decided advantage. Another and very important consideration is, that cottonseed meal, one of the richest dairy feeds, is produced here and can be purchased by the dairymen of North Carolina much cheaper than by the dairymen in the States farther north. Furthermore, leguminous crops grow remarkably well here and there is more corn being grown every year, which speaks well for the dairy possibilities. A growing interest in dairying is shown by the large number of new silos constructed during the past few years.

To improve and develop the dairying of the State in a substantial way, those interested must go about it in a careful, systematic manner, using good sound business methods and keeping careful records of all details. It is the purpose of this bulletin to make suggestions and to demonstrate, if possible, whereby the dairyman can feed and manage his dairy herd in a profitable manner.

Selecting a Good Dairy Cow.

To select good high milk producing dairy cows requires experience and a careful study of cows. The best judges make mistakes at times, but there are certain well defined rules which, if carefully followed, will prove satisfactory in the majority of cases. First of all, it must be considered what constitutes a good dairy cow. The dairy cow is an animal that has been developed to produce milk and butter economically. The most economical producers as a rule show a characteristic dairy type known as the triple wedge form. All of the breeds of dairy cattle conform to this type in a general way, although they may be radically different in breed characteristics. Typical dairy animals are angular and muscular, rather than smooth and evenly fleshed. Experience teaches that the lean, clean cut cows showing quality in thin mellow hide, fine hair, and bone, are the most economical producers as a rule, provided they have a good feed capacity, strong constitution, and a well developed udder. These essentials are too often ignored in the

selection of cows for dairying purposes. To be a producer a cow must be able to consume, and this ability is best shown in the cow that possesses the deep, well sprung middle. To produce economically she must possess a lean, clean cut character, showing that she is turning her feed to good account in milk and butterfat production. To be able to feed heavily and consistently, a cow must have a strong constitution, shown by a deep full chest, which allows ample room for her heart and lungs. A well developed pelvic arch is also desirable, as it gives a cow strength where strength is needed in supporting weight, and ample room for her reproductive functions. A cow may possess the essentials of feed capacity, constitution, quality and form, but lack in udder development and thereby become an undesirable cow from a dairy standpoint. To be an efficient producer a cow should have a large, well developed, soft, pliable udder which helps to complete the dairy structure. The most desirable udder is one that fits rather closely, being evenly balanced, extending well up between the thighs, and well forward on the belly, with teats of uniform size placed well apart to allow easy milking. The typical dairy cow shows greater depth and thickness through the rear portion of the body than through the front. This is necessary as greater space is required for a well developed digestive system than for a well developed respiratory system. This gives the cow a wedged appearance as viewed from both side and top. The third

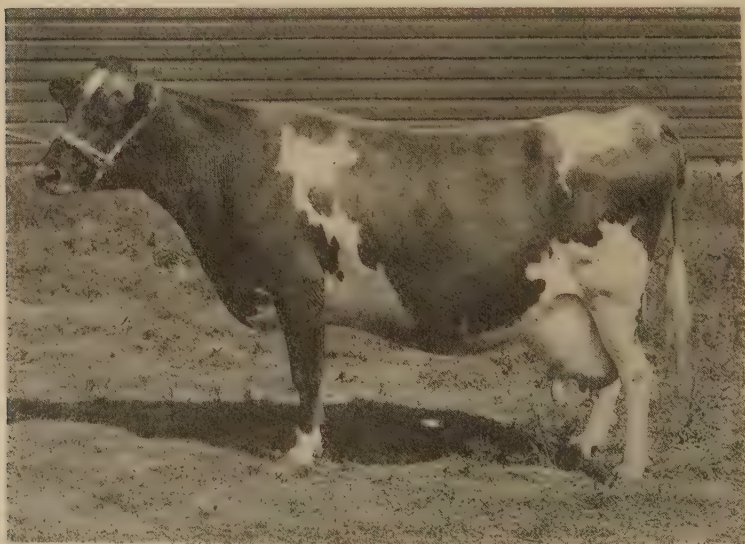


FIG. 1—Grade Jersey cow showing the typical wedge form from the side. A splendid feeder and producer.

wedge of the triple wedge indicates refinement and constitution, the point of the wedge being the thin sharp withers and the base, and the broad, well developed chest.



FIG. 2—Grade Jersey heifer lacking in feed capacity and constitution as shown by shallow, thin body. A light feeder and poor producer.

In selecting a dairy cow avoid the one with a thin narrow head, small muzzle, weak jaw, narrow chest, with legs set close, and feet pointing outward, and short flat ribs, for such cows do not possess the capacity or strength for heavy production. They will prove as a rule



FIG. 3—Three year old Jersey heifer showing good dairy type. A good feeder and excellent producer. Record for 120 days was 3371.8 pounds of milk and 181.8 pound of butter.

to be weak, poor feeders, and consequently poor producers. Also avoid the one that possesses a short, heavy masculine head and neck, thick

fleshy shoulders and coarse withers. Such cows often use a large portion of the food supplied them in putting flesh upon their own body rather than for producing milk and butter economically. Figures 3 and 4 demonstrate clearly the difference between a Jersey heifer, showing good dairy form, and another of the thick fleshy type which shows considerable masculinity in having a short heavy head and neck. The records of these two heifers brings out clearly the ability of the one showing the dairy type to produce milk and butter, while the record of the other is just about what we could expect considering her conformation. Both heifers have been kept under favorable conditions and have been well fed. While one has been making a splendid profit the other has barely paid for her feed.

Feeding Dairy Cows.

The cost of keeping a mature dairy cow in the various States ranges from \$42, as reported by some of the Middle Western States, to \$80 to \$90 per year in some of the Eastern States. This wide range in cost is due to the range in price of feeding stuffs in the various States and to the length of time which the cows must be confined to the stable. Good permanent pastures also greatly reduce the cost of maintaining a herd. There is no phase of the dairy industry that requires more careful attention than the feeding. Neglect and oversight on the part of the feeder will often greatly reduce the profits if not make the herd unprofitable. In feeding the dairy cow it must be borne in mind that the feeding of the animal is for the production of human food and that to secure best results she must receive foods she can handle economically and produce a maximum amount of milk from them.

The balanced ration which has come to be quite generally known is meant one from which the animal receives sufficient quantity of each nutrient of the food so that it can maintain itself and do satisfactory work in addition. The work in the case of the dairy cow is the production of milk and butterfat. The work of the draft horse is hauling. With the sheep, it is growth of fleece or flesh. For the pig growth or fat production, and the beef steer meat production. In other words a ration can be balanced so as to meet the requirements of any animal or class of animals.

It is a well known fact that plants in some form or other form the bulk of the food of domestic animals. For plant growth certain conditions are necessary, such as light, heat and the presence of available plant food in the form of various combinations of elements in solution in the moisture of the soil. The roots of the plant absorb this plant food in the form of sulphates, phosphates, chlorides and nitrates, taking it up through the stems until it reaches the leaves where, by the aid of the sun and the peculiar structure of the cells of the leaf, it is broken up, reuniting with elements which come in through the leaves and then is stored as plant tissue which serves as animal food. Considering the plant from a food standpoint, it is found that the elements have been rearranged into what are known as the protein group, those containing nitrogen which are used in forming muscle, milk, wool, etc.; carbohy-



FIG. 4—Three year old grade Jersey heifer showing coarseness in a masculine head, neck and shoulders, and undesirable form of udder. Record for 120 days 1389.4 pounds of milk and 80.8 pounds of butter.



FIG. 5—Grade Jersey cow five years old shown eighteen months after calving. Record for one year, 9147 pounds of milk and 472.43 pounds of butter. A good type to select.

drates such as sugars and starches, which are used in keeping the body warm and forming fat; and those known as fats or oils which are used in keeping the body warm and for forming fat. These three—protein, carbohydrate and fat—are known as digestible nutrients. Other compounds are also stored in the plant such as water, which is usually found in large quantity in growing plants and mineral matter, found in small amounts and very important in the development of the bony framework of the animal.

In feeding animals it must first be considered that they require a certain amount of nutrition for maintaining their body. And if we are going to expect extra work from them we must supply enough extra nutrition to meet the demands upon the animal. For example, a dairy cow weighing 1,000 pounds must have .7 pound protein, 8. pounds carbohydrates and .1 pound fat to maintain herself without gain or loss when she is not milking and is at rest. When producing an average of 22 pounds of milk per day she must receive 2.5 pounds protein, 13 pounds carbohydrates and 0.5 pound fat, according to the German standard. The experience of the dairymen of the United States has demonstrated that dairy cows can produce satisfactory results when receiving less protein and slightly more carbohydrates than the figures mentioned, thereby lessening the cost of the ration somewhat, as carbohydrate foods are usually cheaper than those high in protein. The grains or the foods known as concentrates which carry a high per cent of protein and which can be used satisfactorily in feeding dairy cattle are cottonseed meal, distillery grains, brewers' grains, linseed meal, cowpeas, soy beans, gluten meal, gluten feed, malt sprouts, buckwheat shorts, buckwheat middlings, peanut meal and wheat bran. Those which carry a high per cent of carbohydrates and which can be used in feeding dairy stock satisfactorily are corn, wheat and wheat middlings, rye, barley, rice, sorghum seed and Kaffir corn. These feeds are commonly used alone for fattening cattle, but may be used in connection with the protein feeds for dairy stock. Among the coarse feeds rich in protein are the legumes, as the clovers, peas, beans and alfalfa which carry a high per cent of digestible protein, so are exceptionally valuable in feeding dairy cattle; as by their use we can avoid feeding so much high priced concentrated feed. The coarse feeds that carry a considerable percentage of carbohydrates and fat are corn fodder, corn stover and corn silage and practically all of the true grasses as timothy, orchard grass, oats, wheat, barley and rye.

To formulate a satisfactory dairy ration, a number of factors must be considered such as size of the cow, period of lactation and condition and ability to produce. Some important considerations to bear in mind in selecting feeds are variety, palatability and digestibility. A safe rule to follow is to always supply as much coarse feed in the form of silage and hay as the cows will clean up and then supply as much grain extra as is required to balance the ration and secure the desired results in production. An average size dairy cow will consume about 35 pounds of corn silage per day, and if this amount is fed she will eat from ten to twelve pounds of good hay in addition. With this as a basis in

feeding, a very good rule to follow in grain feeding is to allow one pound of grain for every three pounds of milk produced daily or one pound of grain for each pound of butterfat produced weekly. For example, a cow producing four gallons of milk per day or ten pounds of fat per week should be given ten pounds of hay, thirty-five pounds of corn silage and ten pounds of grain. In making up the grain ration it is desirable to use a combination of three or four grains mixed in right proportion so as to balance up the ration to meet the requirements. Variety is also secured by using three or four different feeds, which is quite a consideration in holding cows on feed for a continuous period.

Some good dairy rations are outlined below, the amounts to be supplied daily in two feeds:

1. Corn silage, 35 pounds; clover hay, 10 pounds; grain mixture, made up of distillery grains three parts, cottonseed meal two parts, wheat bran one part.

2. Clover hay, 20 pounds; grain mixture: wheat bran one part, corn meal two parts, oats one part, and cottonseed meal one part.

3. Peavine hay, 10 pounds; corn stover, 12 pounds; grain mixture: gluten feed two parts, wheat bran one part, and oats one part.

4. Corn silage, 25 pounds; peavine hay, 14 pounds; grain mixture: cottonseed meal two parts, corn meal two parts, wheat bran two parts.

5. Peavine hay, 15 pounds; dried beet pulp, 4 pounds (before moistening); grain mixture: cottonseed meal two parts, brewers' grains three parts, wheat bran one part.

It will be noticed that only clover and peavine hay were considered in the rations mentioned. Hay from the grasses can be used in feeding dairy cows, but it is not as desirable as good leguminous hay. The grasses do not carry the high per cent of protein that the legumes do and that is so essential for dairy cows. Corn silage is such a common dairy feed, it was included in a number of the rations. It is one of the best feeds that the dairyman can provide for his cows and enough should be put up to supplement short pastures as well as for winter feeding. Five to six tons provided for each cow will carry the herd through the greater portion of the year. If it is not possible to pasture it is very desirable to provide some green feed such as green rye, wheat, oats, and peas or corn. The fall sown crops like rye and wheat will furnish feed by the first of May. As a rule the wheat will be ready after the rye is gone. Canada field peas and oats sown on good soil in late February will make feed by the latter part of May, and by sowing at different periods green feed can be had for a considerable period in the spring. The clovers are often ready for feeding in May, and they make the best kind of green feed for dairy cows. As all growing plants carry a high per cent of water it is desirable to allow them to stand until they develop well so as to secure as much nutrition as possible, rather than feed them when immature when they carry a high per cent of water and are low in nutrients.

Corn Silage.—It is especially important to understand the development of the nutrients in the corn plant when putting up silage. In the past many people have made the mistake of cutting the corn too

early, before the plants had time to mature a maximum amount of digestible feed. In such cases they have had silage of low feeding value. Others have been obliged for various reasons to leave the corn standing too long, so as to become dried out. Such corn does not carry sufficient water to make the silage moist enough to prevent rotting. If the corn is cut when it is well glazed with the stalk still green, and when put into the silo cut fine, evenly distributed and thoroughly packed, there will be very little loss providing the silo is tight and reasonably well constructed.

Corn silage is one of the cheapest and best feeds that the dairyman can provide for his herd, and if every dairyman in North Carolina could feed corn silage in liberal quantities, dairying in general would be more profitable and the average production of the cows of the State would be materially increased.

Herd Improvement.

Our breeds of cattle have been developed and improved by a few thoughtful men who realized the value of good stock. The dairymen of this State can materially improve the quality of their stock if they will go about it in a careful, systematic manner. It is a pleasure to note that there are a number of excellent herds in the State that have been developed by progressive, energetic men.

To improve and develop a good dairy herd much depends upon the herd bull and his ability to get calves that will mature into better cows than their dams. It is a common mistake among dairymen to think that it makes very little difference what kind of a bull their cows are bred to, just so they get with calf. Such ideas are largely responsible for the low average production of the dairy cows in many of our States. It is unreasonable to expect to secure strong, vigorous, healthy, high producing offspring from immature nondescript sires. There are entirely too many grade and scrub bulls scattered over the State for the welfare of the dairy industry, and until the people in general realize the importance of securing better breeding stock there is little hope for improvement. It is a common thing to find a yearling bull in active service, and perhaps he is given an opportunity to serve three or four times as many cows as he should rightfully have considering his age. Early breeding is responsible for loss in size and vigor very frequently.

Care and Management of Bull.

If it is necessary to use the yearling bull he should be well grown for his age before he begins service and receive the best of care from that time on. By the best of care is meant plenty of good, clean, substantial feed that will keep him growing and keep up his vigor. The ration should carry considerable protein and should always be sufficient to keep him improving. At first, one cow a week is sufficient and as he grows, develops and matures the number may be increased, if it is necessary, so that he may serve one or two a day when he is mature.

Sudden changes in the feed and extremes should be avoided. To keep the bull strong and vigorous he must receive regular exercise. This may be obtained in a small lot, by tread power or in running up and down under a strong overhead line. The tread power is responsible for many a good bull retaining his strength, vigor and ability to breed successfully until an advanced age. It is a common opinion among some that when the bull gets to be three or four years old he should be killed and a yearling take his place. Not so, he has just reached the period of greatest usefulness in his life if he is rightfully handled. Any one with good judgment can see where it would be advisable to secure the services of a tried, mature sire rather than take chances with an untried immature sire.

In feeding the herd bull it must always be remembered that to maintain vigor considerable nitrogenous food must be supplied. A grain mixture of oats three parts, wheat bran three parts, corn meal two parts and linseed meal one part, fed along with good leguminous hay and a small amount of corn silage will keep the bull in excellent condition. Some people think that the bull should get his feed from what the cows leave, but this is poor policy as the bull is going to have too much influence over the future of the herd to be treated in this way.

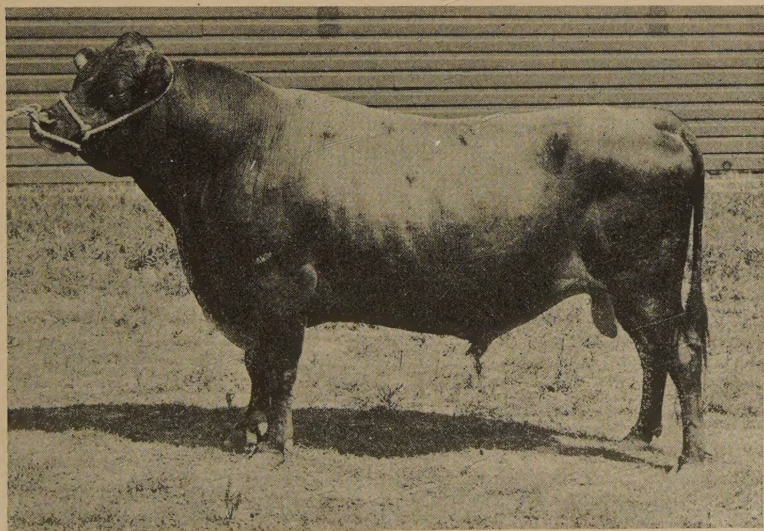


FIG. 6—Jersey bull, Eminent 19th, 78620, at four years of age. An excellent type of bull at the age of greatest usefulness.

Figure 6 shows the pure bred Jersey bull Eminent 19th in breeding condition. This bull has as fine a lot of daughters as can be found anywhere and the majority of them are out of grade Jersey cows. The uniformity of his get is something remarkable, yet is just what can be expected of a high class, splendid individual with such ancestry back of him.

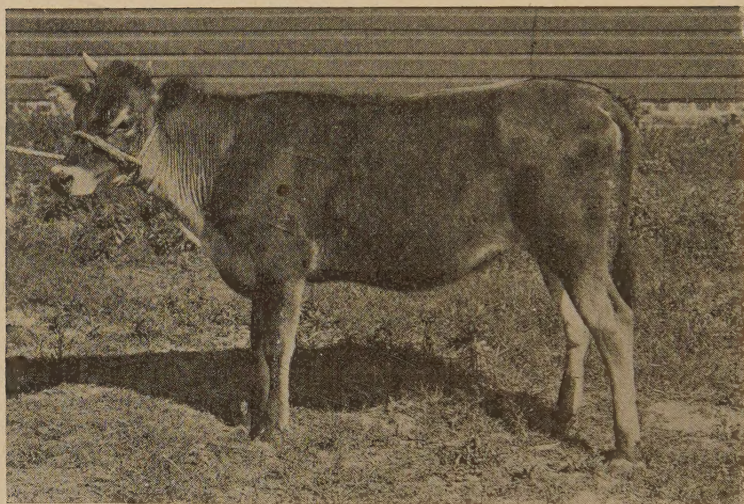


FIG. 7—Jersey heifer, Eminent's Nina, showing desirable form for developing into dairy cow.

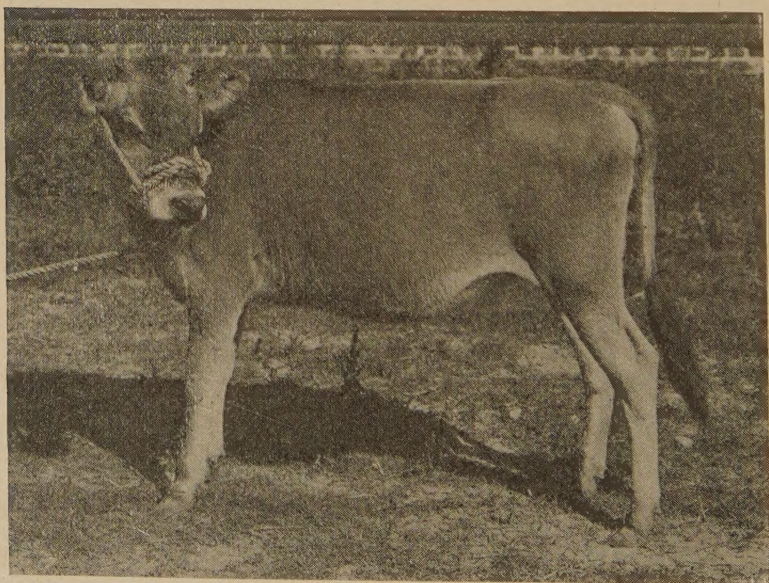


FIG. 8—Grade Jersey heifer by Eminent 19th, showing excellent form and dairy indications.

Dairy Calf.

Feeding and Management.—Some dairymen consider that they can not afford to raise their own cows and prefer to go out through the country and take their chances in picking up a good cow as they need one. The number of cows bought in this way that really prove to be worth their purchase price is very small. It is much more satisfactory in the long run to raise the cows for the dairy and in this way know the history of the animal and something about what can be expected in the way of production.

As a rule where milk is retailed the price is such that the owner considers it unprofitable to feed the calf on whole milk for any length of time, but it is advisable to make a little sacrifice at first for the welfare of the calf later on. If the calf gets well started there will be little trouble. There is no objection to leaving the calf with the cow for three or four days or until the milk is fit for use. The calf can be taken away then and placed in a separate stable if it is possible, as the cow will give less trouble if the calf is where she can not see it. By missing one feed, the calf will usually be hungry enough to be anxious to start to drink readily and will usually give little trouble when it finds that the bucket contains the supply. Four pounds of milk per feed fed three times a day for the first ten days will give the calf a good start when a small amount of skim milk may be substituted for a part of the whole milk, the amount of skim milk being increased so that when the calf is a month old, it is getting skim milk entirely. When the calf is two weeks old the feeds may be changed to two per day with the amount of milk increased gradually as the calf shows ability to handle it. As a rule when a calf is three weeks old it will begin to eat a little grain and it will usually be well to supply some to replace the butterfat removed from the milk. An excellent grain mixture for calves is one made of corn meal, oats, and wheat bran in equal parts with a little linseed meal added. To grow calves well they should have just what grain they will clean up readily at each feed. Plenty of green grass is good for growing calves, but if it is hot and dry or winter time a fine quality clover hay will produce excellent results. In addition to being nutritious, the clover hay carries considerable mineral matter which will help materially in developing the framework. Calves should have milk until they are at least five or six months old for best results. If they are forced to subsist on coarse feeds and grain too young they will be stunted, as their digestive system is not developed enough to handle such food, exclusively, at an early age.

A common mistake among some dairymen is to feed just what they happen to have to their calves instead of securing feeds that the calf can thrive on. In the Southern States cottonseed meal is commonly fed to calves, and it is one of the poorest feeds that can be given the young calf. If it does not prove to be fatal, it will be decidedly detrimental to thrift. The writer, in some feeding trials at this Station recently, has used cottonseed meal with other grains and has found that calves could not handle the meal satisfactorily until they were ten or twelve months old. In every case it proved detrimental to development

where the calves were under ten months of age. This being true, it would be better to feed some other feed while the calves are young, such as oats, bran, and corn, which are known to be satisfactory. To secure good size the animal should continue to grow steadily until mature. If allowed to stop growing through neglect in feeding or other causes they become more or less stunted.

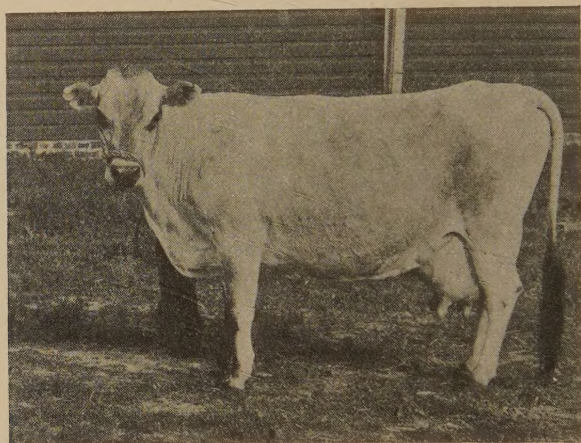


FIG. 9—The Jersey cow—G. M. K.'s Sylvia at ten years of age. Good dairy form and still doing good work in the herd.

Age to Breed Heifers.

As too early breeding of heifers is almost sure to prove detrimental to perfect development, it is well to allow them to get fairly well advanced before breeding for the first time. The dairy breeds vary in length of time required for maturing so it is necessary to breed some heifers later than others. Heifers of the Jersey or Guernsey breeds may safely be bred to drop their first calf when they are twenty-four to thirty months old, provided they are well grown. If not well developed, it will be advisable to give them a little more time. As the Ayshires and Holsteins are a little slower in maturing, they should be bred later, so as to drop their first calves when they are thirty to thirty-six months old. This will give them opportunity to develop into good sized useful dairy cows. With good care and management the cow should be able to freshen each year and continue to be a good producer until she is at least twelve years old. It is not at all uncommon to find a cow much older than this doing good work in the dairy herd.